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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/719,431
Filing Date: November 21, 2003
Appellant(s): KRISTOFFERSEN ET AL.

Evan Reno Sotiriou
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 28 Oct 2009 appealing from the Office action mailed 28 May 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,050,945	Peterson	4-2000
6,511,432	Moore et al	1-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson (US Patent No. 6,050,945), hereinafter Peterson ('945), in view of Moore et al (US patent No. 6,511,432), hereinafter Moore ('432), both previously of record.

Regarding claims 1 and 21-23, Peterson ('945) teaches an ultrasound method and probe, the probe including a transmit section input, a transmit section output, receive signal blocking circuitry between the transmit section input and transmit section output, a receive section input, a receive section output, and transmit signal blocking circuitry between the receive input and output (col. 5 lines 8-20), the transmit signal blocking circuitry including a coupling capacitor capable of decoupling the receive section during operation of the transmit section.

Peterson ('945) does not teach a coupling capacitor capable of decoupling the receive section during operation of the transmit section. In the same field of endeavor, Moore ('432) teaches a blocking capacitor 60 is effective to shield the receive circuit processing elements from potentially damaging high voltage transmit signals (col. 2 lines 6-15, col. 4 lines 36-43). It would have been obvious to one of ordinary skill in the art to have included the blocking capacitors of Moore ('432) in the receive circuitry of Peterson ('945) and thereby achieve the claimed invention, in view of the teachings of Moore ('432).

Regarding claims 10 and 11, Peterson ('945) teaches a transducer array (col. 4 lines 53-54), a transmit section coupled through receive signal blocking circuitry to transmit transducer elements, a receive section input coupled to a multiplexed transducer element selected from the transmit transducer elements and adapted to be decoupled during operation of the transmit section (col. 5 lines 8-20), wherein the transmit section output drives the multiplexed transducer element during ultrasound beam transmission and where the receive section input receives a reception signal from the multiplexed transducer element during beam reception (col. 2 lines 50-57, col. 4 lines 31-34).

Peterson ('945) does not teach that the transmit section is also coupled through a coupling capacitor to transmit transducer elements. In the same field of endeavor, Moore ('432) teaches a blocking capacitor 60 that effectively shields between the transmit and receive circuitry (col. 2 lines 6-15, col. 4 lines 36-43). It would have been obvious to one of ordinary skill in the art to have coupled the transmit section and transducer elements of Peterson ('945) via the blocking capacitor of Moore ('432) and thereby achieve the claimed invention, in order to minimize crosstalk between the transmission and reception lines.

Regarding claims 12 and 24, Peterson ('945) teaches that the receive signal blocking circuitry comprises low level signal blocking circuitry (col. 5 lines 26-32).

Regarding claims 4, 13 and 25, Moore ('432) teaches clamping diodes 55 in the transmit blocking circuitry (Fig. 3).

Regarding claims 5 and 26, Moore ('432) teaches back-to-back diodes coupled to the transmit section input and output, as well as clamping diodes coupled to the transmit section input and output (Fig. 3; Examiner notes that, so long as two elements are part of the same circuit, they are effectively "coupled").

Regarding claims 6, 7, 15 and 16, Peterson ('945) teaches back-to-back diodes coupled between multiple transducer elements, wherein the diodes from a short circuit between the elements during transmit (col. 7 lines 7-10). The diodes of Peterson ('945) also form an open circuit during reception.

Regarding claims 8 and 27, Moore ('432) teaches clamping diodes 55 coupled to the receive section input and output, as well as back-to back and clamping diodes 55 coupled to the receive section input and output (col. 2 lines 14-15, Fig. 3).

Regarding claim 9, Peterson ('945) teaches a voltage step up circuit coupled between the transmit section input and transmit section output (col. 7 lines 50-54).

Regarding claim 14, Peterson ('945) teaches transmit signal blocking circuitry coupled to the receive section output as previously discussed for claim 1.

Regarding claims 17 and 18, the transmit array of Peterson ('945) comprises a 2 x 2 patch of transmit transducer elements (col. 4 lines 49-54).

Regarding claim 19, the multiplexed transducer element of Peterson ('945) is part of a two-dimensional array (col. 4 lines 49-50), which inherently must comprise at least a 2x2 array of four elements, from which three elements can be arbitrarily designated as a "triangular receive aperture comprised of selected array transducer elements" is included in a triangular receive aperture comprised of selected array transducer elements.

Regarding claim 20, neither Peterson ('945) nor Moore ('432) teach that the receive aperture comprises five sections having five, four, three, two and one element (s), respectively. Applicant has not disclosed that this size and arrangement of receive aperture sections solves a particular problem or presents a patentable advantage over the prior art. Furthermore, it has previously been held that merely changing the size and/or arrangement of known elements is obvious and unpatentable over the prior art (*In re Rose* , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966); *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)). Accordingly, it would have

been obvious to one of ordinary skill in the art to have used a receive aperture having five sections of five, four, three, two and one element (s), respectively, in the system of Peterson ('945) as modified by Moore ('432), and thereby achieve the claimed invention, as such a modification requires nothing more than changing the size and arrangement of known receive aperture elements.

(10) Response to Argument

Regarding claims 1 and 21, Appellant challenges the previous rejection on the basis that Peterson ('945) purportedly lacks "receive blocking circuitry coupled between the transmit section input and output *and* transmit signal blocking circuitry coupled between the receive section input and output" as recited in the claims (Brief p. 13). Appellant admits that the reference does disclose sets of back to back diodes at the receive and transmit stages, wherein such reference limiters are used to "correct for noise", but argues that such back to back diodes cannot constitute "receive signal blocking circuitry" and "transmit signal blocking circuitry" as claimed (Brief p. 13).

Examiner notes that, where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "blocking circuitry", as recited in claims 1-27, was not so redefined to the extent that it must be interpreted in any scope narrower than its broadest reasonable interpretation according to what is known in the art. Accordingly, any circuit element that prevents or limits some signal from passing therein can be reasonably interpreted to constitute "blocking circuitry". Diodes, as taught by Peterson ('945), are commonly known in the art as circuit elements which inherently restrict the flow of current. Accordingly, the back to back diode arrangement of Peterson ('945) reasonably constitutes the claimed blocking circuitry, regardless of whether the reference expressly refers to the diodes as such.

Appellant further alleges that the combination of Peterson ('945) and Moore ('432) is improper because such combination was purportedly made absent of any acceptable motivation to do so (Brief p. 14). Specifically, Appellant contends that the Examiner "fails to provide any articulated reasoning in support of its conclusion". Examiner respectfully directs the Board's attention to the second paragraph of the rejection reiterated above, wherein it is clearly stated that Moore teaches "a blocking capacitor 60 is effective to shield the receive circuit processing elements from potentially damaging high voltage transmit signals (col. 2 lines 6-15, col. 4 lines 36-43)", and that Peterson ('945) is modified to include the

capacitor of Moore ('432) in view of such motivation taught by Moore ('432), i.e. to shield the receive circuit processing elements.

Regarding claim 10, Appellant contends that Peterson ('945) lacks a "multiplexed transducer element" as recited by the claim (Brief p. 15). Appellant argues that the recitation "multiplexed transducer element selected from the transmit transducer elements" requires that "particular transducer elements are selected using the multiplexed arrangement not a particular channel for operation" (Brief p. 15). It appears that Appellant is attempting to improperly limit the Office's interpretation of the claim to a narrower scope than what is encompassed by its broadest reasonable interpretation, given what is commonly accepted in the art. The commonly accepted meaning of "multiplexed" is "being or relating to a system of transmitting several messages or signals on the same circuit or channel". As Appellant has failed to redefine the term "multiplexed" to mean anything other than what is known in the art, it is proper to interpret the term as having the broadest reasonable scope according to that definition. Peterson ('945) teaches a transmit transducer element (i.e., one that is "selected from transmit transducer elements") that is connected in such a way that it can be used to transmit both a transmit and a receive signal (col. 5 lines 8-20), which constitutes multiplexed element according to the definition known in the art. As such, the prior art does in fact meet the claim.

Regarding claim 19, Appellant argues that Peterson ('945) fails to meet the claim because the reference fails to describe or suggest a "selection to form a triangular receive aperture" (Brief p. 16). Examiner notes that the claim does not recite the selection of a receive aperture, only that "the element is included in a triangular receive aperture comprised of selected array transducer elements". Since the two-dimensional transducer array of Peterson ('945) must inherently comprise at least four elements forming a 2x2 array, a skilled artisan could arbitrarily deem any three of those elements to constitute a "selected triangular receive aperture", and as the multiplexed element is also taught as being part of such transducer array, such element thus meets the limitation of being "included in a triangular receive aperture". In other words, any three elements of the at least 2x2 reference array can constitute the "selected triangular receive aperture", and since the multiplexed element is clearly taught as being part of the array, such element is reasonably interpreted as being "included in a triangular receive aperture".

Regarding claim 20, Appellant challenges Examiner's reliance on precedent case law to show that choosing a receive aperture having five sections of five, four, three, two and one element(s) respectively is obvious over the prior art (Brief p. 16). Specifically, Appellant contends that the mere recitation of a supposed per se rule of obviousness is an improper basis for rejection (Brief p. 17). As clearly set forth in MPEP 2144.II, "[i]f the facts in a prior legal decision are sufficiently similar to those in an application

under examination, the examiner may use the rationale used by the court" but "[i]f the applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on the rationale used by the court to support an obviousness rejection". Appellant has not demonstrated such criticality, and as such it is in fact proper to rely on the aforementioned precedent case law to obviate changes in the size or arrangement of aperture elements to achieve the claimed invention.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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